

## PATENT

Atty. Dkt. No. APPM/005378/CMP/ECP/CKIM

**IN THE CLAIMS:**

Please cancel claims 27-35, and amend the claims as follows:

1. (Currently Amended) A chemical control system for controlling the chemistry of a chemical solution having predetermined chemical constituents in a plating system, the chemical control system comprising:
  - a mix container for containing a plating solution;
  - a hold container for containing a plating solution delivered from said mix container;
  - a precision delivery arrangement for delivering a precise predetermined quantum of a predetermined constituent of the plating solution to ~~a selectable combination of said mix container, said hold container, or both said mix container and said hold container;~~
  - a transfer pump for urging the plating solution to be transferred from said mix container to said hold container, and;
  - a source of deionized water in communication with said mix container; and
  - a nitrogen gas source in communication with said source of deionized water for providing to said mix container a flow of nitrogen source gas to which has been added deionized water to form humidified nitrogen gas, the humidified nitrogen gas being humidified to a predetermined relative humidity with respect to the temperature of the plating solution in said mix container.
2. (Original) The chemical control system of claim 1, wherein the plating solution is used in a NiFe plating system.
3. (Currently Amended) The chemical control system of claim 1, wherein said ~~nitrogen gas source~~ of deionized water comprises a column for containing the deionized water and releasing the humidified nitrogen gas, said column being in thermal communication with said mix ~~tank~~ container.

## PATENT

Atty. Dkt. No. APPM/005378/CMP/ECP/CKIM

4. (Original) The chemical control system of claim 3, wherein there is further provided a nitrogen source gas outlet arranged to release the nitrogen source gas to the deionized water within said column.
5. (Original) The chemical control system of claim 4, wherein said nitrogen source gas outlet is arranged to release the nitrogen source gas at a variably selectable location along said column, the relative humidity of the humidified nitrogen gas being responsive to the location along said column at which said nitrogen source gas outlet is arranged to release the nitrogen source gas to the deionized water.
6. (Original) The chemical control system of claim 1, wherein there is further provided a further nitrogen gas source for providing to said hold container a flow of further nitrogen source gas that has been humidified to a predetermined relative humidity with respect to the temperature of the plating solution in said hold container.
7. (Currently Amended) The chemical control system of claim 6, wherein said further nitrogen gas source comprises a further column for containing deionized water and releasing the humidified further nitrogen gas, said column being in thermal communication with said hold ~~tank~~ container.
8. (Original) The chemical control system of claim 7, wherein there is further provided a further nitrogen source gas outlet arranged to release the further nitrogen source gas to the deionized water within said further column.
9. (Original) The chemical control system of claim 8, wherein said further nitrogen source gas outlet is arranged to release the further nitrogen source gas at a variably selectable location along said further column, the relative humidity of the humidified further nitrogen gas being responsive to the location along said further column at which said further nitrogen source gas outlet is arranged to release the further nitrogen source gas to the deionized water.

## PATENT

Atty. Dkt. No. APPM/005378/CMP/ECP/CKIM

10. (Original) The chemical control system of claim 1, wherein said precision delivery arrangement comprises a serial arrangement of a source pump and an orifice.
11. (Original) The chemical control system of claim 10, wherein said source pump is a pneumatic pump.
12. (Currently Amended) The chemical control system of claim 11, wherein there is provided a further mix container, and said [[a]] precision delivery arrangement is arranged to deliver a precise predetermined quantum of a predetermined constituent of the plating solution to each of said mix container and to said further mix container.
13. (Original) The chemical control system of claim 11, wherein said source pump is a positive displacement, double diaphragm pump.
14. (Currently Amended) The chemical control system of claim 11, wherein said source pump is configured to pump the predetermined constituent of the plating solution at a constituent flow rate in a range of approximately 100 ml/min to 1.0 l/min.
15. (Original) The chemical control system of claim 14, wherein said source pump has a rated flow rate of approximately three to seven times the constituent flow rate.
16. (Original) The chemical control system of claim 15, wherein said source pump has a rated flow rate of at least approximately four times the constituent flow rate.
17. (Original) The chemical control system of claim 14, wherein said orifice has an internal diameter of approximately between 0.010" and 0.090".
18. (Original) The chemical control system of claim 17, wherein said orifice has an internal diameter of approximately between 0.040" and 0.050".

PATENT

Atty. Dkt. No. APPM/005378/CMP/ECP/CKIM

19. (Original) The chemical control system of claim 1, wherein there are further provided:  
a mix pneumatic level sensor for providing an indication of the level of the plating solution in said mix container; and  
a hold pneumatic level sensor for providing an indication of the level of the plating solution in said hold container.
20. (Currently Amended) The chemical control system of claim 19, wherein said mix and hold pneumatic level sensors are arranged to provide a measurement along a predetermined length of the ~~respectively associated ones of~~ said mix and hold containers, respectively.
21. (Original) The chemical control system of claim 19, wherein said mix and hold pneumatic level sensors each are arranged to employ a gas flow rate on the order of 10 cc/min.
22. (Original) The chemical control system of claim 1, wherein said transfer pump is a pneumatically operated bellows pump.
23. (Currently Amended) The chemical control system of claim 22, wherein said transfer pump is provided with a ~~Teflon~~ bellows made of Teflon polymer.
24. (Original) The chemical control system of claim 1, wherein there is further provided a dummy plating anode in said mix container.
25. (Currently Amended) The chemical control system of claim 1, wherein there is further provided a chemical analyzer system that ~~analyzes~~ is adapted to analyze the plating solution in said mix container.
26. (Currently Amended) The chemical control system of claim 25, wherein said chemical analyzer system ~~that analyzes~~ the plating solution in said hold container.

PATENT

Atty. Dkt. No. APPM005378/CMP/ECP/CKIM

27-35. (Cancelled)